The schematic of a typical ADS field assembly is given in Figure 4.2. Air is drawn through the ADS by a pump. The airflow initially enters a TeflonTM coated cyclone that effectively removes coarse particles of >2.5 micrometers in aerodynamic diameter. The airflow then leaves the cyclone and enters the first of the two denuders that are connected in series. From this point, the air stream passes only through coated glass annular space until it reaches the filter pack. The first denuder is coated with sodium carbonate, Na₂CO₃ (A 50% [v/v] solution of methanol in deionized water containing 1% [w/v] glycerol and 1% [w/v] Na₂CO₃) to collect acidic gases and the second with citric acid, C₆H₈O₇ (A 50% [v/v] solution of methanol in de-ionized water containing 1% [w/v] C₆H₈O₇) to collect basic gases.

Nylon Filter - Nitric Acid Teflon Filter - Ammonium, **Filter Pack** Nitrate and Sulfate **Citric Acid Coated Ammonia Denuder Acid Gases Sodium Carbonate** Sulfur Dioxide, Nitrous Acid, **Coated Denuder** Nitric Acid, Hydrochloric Acid, Hydrofluoric Acid **Cyclone** $2.5 \, \mu m \, cut$ Air Flow

Figure 4.2 Typical ADS Field Assembly

Since the airflow through the annular denuders must be laminar in order to ensure that the gases separate from the fine particles, the concentric tubes are inset approximately 25 mm from the flow entry end of the annular denuder (see Figure 4.1) to allow the air stream to become laminar